NASA Policy Directive

NPD 8720.1C
Effective Date: April 18, 2008
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COMPLIANCE IS MANDATORY

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Request Notification of Change (NASA Only)

Subject: NASA Reliability and Maintainability (R&M) Program Policy

Responsible Office: Office of Safety and Mission Assurance

1. POLICY

It is NASA policy for all programs and projects to accomplish the following during all phases of development and operations commensurate with an ongoing pursuit of improved safety and mission success and in accordance with NPD 8700.1:

a. Establish, document, and implement--

(1) System R&M design and operational performance requirements (qualitative and quantitative).

(2) System maintenance concepts, including, but not limited to, maintenance requirements, schedule, and responsibilities.

(3) R&M engineering, analysis, testing, and maintenance activities addressing hardware, software, firmware, and human elements.

(4) Timely and continuous assessment of compliance with the R&M requirements and the continuous identification of areas for improvement.

(5) Integration of R&M engineering activities with systems engineering, risk management, and other processes, assessments, and analyses including, but not limited to, safety, security, quality assurance, logistics, probabilistic risk assessment, life-cycle cost, configuration management, and maintenance.

b. Share R&M data and experience for use as heritage data in support of current, follow-on, and new programs or projects.

2. APPLICABILITY

a. This NPD is applicable to NASA Headquarters and NASA Centers, including Component Facilities and Technical and Service Support Centers. This NPD applies to the Jet Propulsion Laboratory or to other contractors or international partners only to the extent specified or referenced in applicable contracts, grants, or agreements.

b. This NPD does not apply to facility projects. Implementation of R&M on facilities is in accordance with NPD 8831.1, Maintenance of Institutional and Program Facilities and Related Equipment; NPR 8820.2, Facility Project Requirements; NPR 8831.2, Facilities Maintenance Management; NASA Reliability Centered Maintenance Guide for Facilities and Collateral Equipment; and NASA Reliability Centered Building and Equipment Acceptance Guide.

3. AUTHORITY

42 U.S.C. § 2473(c)(1), section 203(c)(1) of the National Aeronautics and Space Act of 1958, as amended.

4. Applicable Documents

a. NPD 8700.1, NASA Policy for Safety and Mission Success. b. NPR 8705.6, Safety and Mission Assurance Audits,

Reviews, and Assessments.

5. RESPONSIBILITY

a. The Chief, Safety and Mission Assurance shall do the following:

(1) Oversee the implementation of R&M activities to assure that they are properly implemented on all Agency programs and projects (Requirement).

(2) Oversee, by use of audits or other measures, the performance of the R&M design and operational requirements in all major programs and projects (Requirement).

(3) Inform Mission Directorate Associate Administrators regarding the performance of the R&M design and operational requirements in all major programs and projects under their cognizance (Requirement).

b. Mission Directorate Associate Administrators shall do the following:

(1) Evaluate the effectiveness of R&M activities and the R&M performance measures of programs and projects under their cognizance (Requirement 13005).

(2) Ensure that R&M data and experience are shared across programs and projects (Requirement).

c. Program managers shall do the following:

(1) Ensure that program-level R&M design and operational performance requirements (qualitative and quantitative) are established (Requirement). In addition to reliability performance measures, R&M requirements should address availability measures where applicable.

(2) Ensure that project-level system R&M design and operational performance requirements (qualitative and quantitative) are allocated and coordinated such that they are consistent with program-level R&M requirements (Requirement).

(3) Assess the compliance with program-level R&M requirements, including the identification of areas for improvement, in a timely and continuous manner (Requirement).

(4) Identify and pursue opportunities for collaboration between projects (Requirement).

(5) Ensure the allocation of funding for R&M activities (including staffing, tools, and training) required to achieve compliance with R&M policies by the program (Requirement).

(6) Ensure that R&M data and experience are shared across projects (Requirement).

d. Project managers shall do the following:

(1) Integrate all R&M activities with systems engineering, risk management, and other processes, assessments, and analyses including, but not limited to, safety, security, quality assurance, logistics, probabilistic risk assessment, life-cycle cost, configuration management, and maintenance (Requirement 13009).

(2) Establish a maintenance framework and approach early in the system's development (Requirement).

(3) Ensure that compatibility is sustained among system design, maintenance planning, and logistics support activities (Requirement 13010).

(4) Establish and maintain a repository of R&M data and analyses that provides a basis for the assessment of R&M performance measures throughout the system's life cycle (Requirement 13011).

(5) Coordinate with the Center Safety and Mission Assurance (SMA) functional manager to ensure that R&M data is available for use as heritage data (Requirement 13039).

(6) Ensure that system R&M design and operational performance requirements (qualitative and quantitative) are established (Requirement). In addition to reliability performance measures, R&M requirements should address availability measures where applicable.

(7) Ensure that R&M activities (addressing hardware, software, firmware, human elements, and interactions between them) are planned and implemented (Requirement). R&M activities include, but are not limited to, requirements specification, failure mode identification, design validation, data collection, quantitative and qualitative modeling and analysis, and testing and demonstration (and the management of these activities). Guidance on R&M program management is provided in NASA-STD-8729.1.

(8) Ensure that R&M activities of contractor organizations are subject to requirements that enable compliance by programs and projects with applicable R&M policies and requirements (Requirement).

(9) Ensure the availability of credible R&M data and analyses to support the assessment of compliance with R&M

requirements (Requirement).

(10) Assess the compliance with the R&M requirements, including the identification of areas for improvement, in a timely and continuous manner (Requirement).

(11) Allocate funding for R&M activities (including staffing, tools, and training) required to achieve compliance by projects with R&M policies (Requirement).

e. The Center SMA functional manager (as defined in NPD 8700.1) shall do the following:

(1) Ensure that R&M data is available for use as heritage data to support the formulation of R&M goals and requirements, quantitative and qualitative reliability analysis, and other R&M engineering activities as part of current, follow-on, or new programs and projects, both at the local Center, and other Centers (Requirement 13042).

6. DELEGATION OF AUTHORITY

None.

7. MEASUREMENTS

Compliance with the requirements contained in this NPD is verified through processes contained in NPR 8705.6, Safety and Mission Assurance Audits, Reviews, and Assessments.

8. CANCELLATION

NPD 8720.1B, revalidated April 28, 2004.

/s/ Michael D. Griffin
Administrator

ATTACHMENT A: (TEXT)

References

a. NASA-STD-8729.1, Planning, Developing and Managing an Effective Reliability and Maintainability (R&M) Program.

b. NPD 8831.1, Maintenance of Institutional and Program Facilities and Related Equipment.

c. NPR 8820.2, Facility Project Requirements.

d. NPR 8831.2, Facilities Maintenance Management.

e. NASA Reliability Centered Maintenance Guide for Facilities and Collateral Equipment. URL: http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCMGuideMar2000.pdf

f. NASA Reliability Centered Building and Equipment Acceptance Guide. URL: http://www.hq.nasa.gov/office/codej/codejx/Assets/Docs/RCB&EGuideJUL04.pdf

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